

youths,<sup>8</sup> they represent an ideal population from which to recruit new smokers. The high use of ethnic-specific models and low use of mixed-ethnicity models observed in ads in African-American neighborhoods suggest that marketing is targeted at ethnic neighborhoods. The use of ethnic-specific models is also consistent with the reality of hypersegregation of African-American communities.<sup>9</sup> It is critical to increase the legislative efforts to limit the application of ethnically targeted campaigns, particularly when such populations have an increased risk of one or more smoking related diseases, or which have a youthful, and therefore vulnerable population. □

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## Research

# Learning to Recognize Scarring among Intravenous Drug Users: A Tool for HIV Risk Reduction

In some metropolitan areas, the seroprevalence of human immunodeficiency virus (HIV) among intravenous drug users is nearly 40% to 50%.<sup>1,2</sup> Furthermore, exposure to HIV through intravenous drug use or heterosexual sex with an intravenous drug user are major causes of HIV infection among women and, secondarily, their children.<sup>1,3</sup> Education of people at risk has been paramount in efforts to prevent the spread of HIV. Published guidelines for counseling stress safer sexual practices, avoidance of intravenous drug use, and techniques to avoid HIV transmission during intravenous drug use.<sup>4,5</sup> They do not stress how to recognize the signs of intravenous drug use in potential sexual partners. The major stigmata are "tracks" or scarring at injection sites.<sup>6,7</sup> If individuals from populations at high risk for potential sexual contacts with intravenous drug users were taught to recognize track marks, this knowledge could be used to forego unsafe sexual encounters. The feasibility of educating nonmedically trained people to recognize such scarring depends upon both the frequency with which scarring occurs and the intensity of the lesions.

During October and November 1995, trained health care professionals at a care center for acquired immunodeficiency syndrome in Westchester County, approximately 20 miles north of New York City, evaluated HIV-infected patients regarding drug use habits, including whether they used intravenous and/or subcutaneous ("skin popping") drugs, duration of intravenous drug use, frequency with which they used intravenous drugs, and the most recent time of such use. The examining health care provider looked at patients for the location and intensity of scarring. Scarring was subjectively graded on a scale from 0 to 3, representing no tracks through tracks that should be recognizable with little if any training. Scarring that was not in the distribution of the vascular system was also noted. Other signs of intravenous drug use such as thromboses, tattooing, or cellulitis were not recorded.

Of 143 patients evaluated, 74 (52%) were intravenous drug users. Among the 69 who were not, 9 patients (13%) had scars on the arms, none of which were along a vascular distribution. In contrast, 56 (76%) of the intravenous drug users had scars that were along a vascular distribution, and 44 (60%) of them had easily recognizable scarring (Grade 2 or 3). None of the users with tracks had the antecubital fossa spared. Skin popping was not frequent in this population (9%) and led to scars in only one patient. Among intravenous drug users in this cohort, 62 (84%) used intravenous drugs at least daily. Although 32 (43%) had used intravenous drugs within the past 2 years and 10 (14%) had used intravenous drugs within 2 months, 34 (46%) of them last used intravenous drugs more than 5 years prior to evaluation.

The best predictor of scarring by logistic regression was the number of years of intravenous drug use. Although none of 6 patients who had used drugs less than 3 years had track marks, 3 of 12 (25%) who had used drugs 5 years or less had scars. Recent intravenous drug use was also associated with significant scarring. Patients who had used intravenous drugs within the previous 2 years (24/32) were more likely to have scarring than those who had not (21/42) ( $p = 0.029$ ). Among patients who had discontinued intravenous drug use more than 5 years before the survey, 53% still had scarring. The frequency of intravenous drug use (weekly, daily, or more than once daily) and race were not independently associated with significant scarring.

These data indicate that scarring is common among intravenous drug users even when cessation of use occurred more than 5 years earlier. I suggest that sexually active individuals from groups at risk for sexual contact with intravenous drug users, particularly inner city youths of lower income, be educated to recognize the signs of intravenous drug use. This proposed educational activity could augment modalities presently being advocated for HIV risk reduction. Perhaps the direct physical finding of a track mark would be a greater deterrent to unsafe sexual practices than abstract or restrictive recommendations. Clearly, however, individuals would also need to be taught that the lack of scarring does not preclude intravenous drug use. □

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## A Shipboard Outbreak of Tuberculosis in Mississippi and Louisiana, 1993 to 1994

In the 1960s and 1970s, several tuberculosis (TB) outbreaks onboard ship were reported by the US Navy.<sup>1-5</sup> We describe here a large shipboard outbreak of TB among a closely confined civilian occupational group. Its occurrence demonstrated a lack of awareness of crowding as an important risk factor for TB transmission.

Employees of the Mat Sinking Unit (US Army Corps of Engineers) are housed in cramped quarters on six quarterboats on the Mississippi River. At the time of this outbreak, there was no routine preemployment TB screening. In early 1994, the Mississippi State Health Department was notified that one employee with active pulmonary TB had remained undiagnosed for 3 months during the 1993 work season, despite several visits to health care personnel. To determine the extent of TB transmission and to determine risk factors for infection, we screened all employees without a documented previous positive skin test or history of TB with Mantoux tuberculin skin testing. Previous tubercu-

lin skin testing results were available for roughly two thirds of the workforce. All persons with current and historic positive test results were referred for chest x-ray. Sputum examination and further investigation were carried out as indicated; mycobacterial isolates were subject to restriction fragment length polymorphism testing.<sup>6,7</sup> Risk factors for transmitting TB were determined by a questionnaire survey of all available 1993 season employees. The working and living conditions on the barges, along with the types of ventilation systems in the cabins, mess halls, and lounges, were thoroughly inspected.

Tuberculin skin tests were completed on 393 (92%) of 429 susceptible employees, and 237 questionnaires were completed about risk factors. Eight additional patients with TB were identified, including three with bacteriologically confirmed disease (and mycobacterial isolates identical to the index case) and five with clinical cases. Four of the eight patients, including the index patient, lived on the same quarterboat. Of 393 employees without a documented prior positive tuberculin skin test, 128 (33%) were found to be positive ( $\geq 5$  mm induration); 40 (17%) of 232 employees with a documented prior negative test showed test conversion. Univariate analysis identified four statistically significant risk factors for having a positive tuberculin skin test: Black race, living on the same quarterboat as the index patient, eating in the back mess hall, and using the onboard lounge facilities. In a logistic regression model, however, only use of lounge facilities remained statistically significant (odds ratio [OR] = 2.9, 95% confidence interval [CI] = 1.4, 6.4). Sixty-three (49%) of the 128 employees with positive tests reported use of the lounge facilities; no particular lounge could be identified that carried a higher risk than the others.

All patients were treated with standard four-drug TB chemotherapy under direct supervision. After negative evaluation for TB disease, all individuals with positive tuberculin skin tests were given secondary prophylaxis with Isoniazid under direct supervision.

Widespread transmission of TB appears to have occurred throughout the quarterboats, favored by the cramped living conditions. The outbreak could have been prevented or limited by timely intervention. In this and similar settings, a high index of suspicion for TB disease and prompt identification and treatment of TB cases are essential.<sup>8,9</sup> Regular TB

screening is also important to identify infected persons at risk of developing TB disease and transmitting infection. □

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## The Adequacy of One Sputum Smear for Diagnosing Pulmonary Tuberculosis

In his recent editorial<sup>1</sup> on tuberculosis control policies in resource-poor countries, Kevin De Cock made highly rel-